Land Market and Land Speculation

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LAND MARKET AND LAND SPECULATION

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I N T R O D U C T I O N

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This report is a product of a research project financed entirely by the Central Mortgage and Housing Corporation, conducted during the summer of 1969. The purpose of the project is twofold. The first purpose is to review works already carried out in North America in the area of the process of land development. The second purpose is to trace the history of some parcels of land from its original use to its use for housing.

The Helleyer's (1) report may have many short-comings but it constitutes an important chapter in the annals of Canadian housing in the sense that it has put into forefront the problem of land speculation and its effect on the nation's welfare. One of the points raised with some insistence was the sustained rise of the price of land and the absence of coherent planning in the area of urbanization.

Many authors have examined the process of land development. Yet, nobody seems to be able to pin-point the whole process. One of the explanations

may be that one tries to understand the process in terms of orthodox economic theory. According to the economic theory, the excess of supply over the demand for a given good and service leads to a reduction in its price. The process of land does not seem to reflect this theory. In fact, the experience of the Montreal area shows that the land price continues to rise in spite of a huge stock of land.

In 1961, it was reported that about 60,000 acres of raw land were available in the Montreal area and this amount of land was sufficient for accommodating urbanization for twelve years ahead. This was surely a case of excess supply. Apparently, the present situation is not much different from the 1961 situation. In spite of such a huge excess of land supply, the price of land has continued to rise in the Montreal area. The most frequent and popular explanation of the land-price-spiral is related with land speculation. Numerous are examples of land speculation. In the Isle de Jésus, an institution sold recently a parcel of land for $9,000 per acre and, a year later, the same land was sold for no less than $19,500 per acre. In the same area, a farm land which had been bought in 1958 for $2,000 was sold, in 1963, for $12,000 per

acre. In the South Shore, some farm lands bought in 1963 for $800 per acre was sold, in 1964, for $4,500 por acre. Furthermore, even if the land is of the same quality in the some small area, the price may vary a great deal. In 1964, the average price of a lot in housing development of single-family bungalows financed under N.H.A. varied between $1,763 and $2,434 (2).

The foregoing examples are convincing evidence of land speculation. Two popular explanations of land speculation have been often offered. One is that land being highly differentiated not only because of peculiar land site characteristics but also because of highly personal consumer preference, the demand for land tends to be little responsive to price levels, so that the land owner can almost dictate the price. Another explanation has been that in the absence of proper land development planning combined with population pressure, the speculator allows himself to hope for large profit by buying up lands which are likely to develop. Furthermore, being aware of the opportunities, important groups of people with substantial capital enters into the land market for speculation, thus enhancing land speculation with greater efficiency leading to

lasting consequences. The Planning Department of Montreal observes :

> "... The population reached such hight as to cause a very marked pressure on the home building industry. The demand exceeded the supply. Small scale land speculation by individuals on small parcels of land become less important. From this time on (1958) very large tracts, sometimes even whole district and sections of rural municipalities were sought by powerful land holding companies...(3)"

There are many consequences of land speculation. It is true that land cost accounts for relatively a small part of total cost of housing. But the true cost of land speculation lies in the fact that land speculation has prevented coordinated and economic land development so that urbanization has led to suburdan sprawl and has increased the costs of public utilities. As a result, the rate buyers have had to bear the burden. The consequence of sprawl may be illustrated. In 1964, in an area already developed, there were 2,493 vacant acres and only 10% of the area was developed. The probability of these vacant lands being developed is remote, for the developer would find less costly lands further away so that the process of sprawl may be even intensified. (4)

To combat land speculation, various measures have been suggested including nationalization of land. However, it appears that many policy suggestions are not sufficiently supported by convincing evidence that they would succeed when implemented. At any rate, it appears that more studies are needed not only for better understanding of the whole process of land development but also specially for the measurement of the consequences of land speculation.

The present report has two parts divided into five chapters. The first part which comprises the first three chapters reviews the current literature on land development and land speculation. The first chapter deals with the sequence of land development and the various agents involved in the land development process. In the second chapter, an attempt is made to summarize various empirical studies which are largely oriented towards the macro-economic approach. In the third chapter, main effort is centered on the explanation of land speculation proper.

The second part consists of one chapter which traces the case history of some 115

acres of land in the municipality of Laval from the original use of the land to its use for housing development. In the concluding chapter, a few critical remarks on the current literature are offered and some suggestions for further studies are attempted.

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P A R T O N E

REVIEW OF CURRENT LITERATURE

ON LAND DEVELOPMENT AND LAND

SPECULATION

CHAPTER I

PROCESS OF LAND DEVELOPMENT

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PROCESS OF LAND DEVELOPMENT

It is our contention that the anatomy of the land development process is best understood by identifying various stages of the process and individuals and institutions involved in the process.

1. Stages of land development

The process of land development is essentially sequential in the sense that it is the result of a chain of key decisions made by various decision agents. Three key decisions may be discerned. The first key decision is made by the farmer to sell his land and by the landowner to buy. The second key decision is made by the landowner to sell and the land developers to buy. Finally, another decision is made by the consumer to buy the land already built up. The key decisions are, of course, affected by supporting decisions of supporting agents such as real estate agents and financial institutions.

In accordance with the chain of key decisions, land undergoes through a series of stages. At the initial state, the land is used for non-urban purpose, mainly for agricultural purpose. As soon as the land is sold to the land speculator, the land becomes potential urban land, for the speculator may like to sell it for non-urban purpose. This stage of land development may last for several years depending upon the speculator's expectation of profit and the rate of urbanization. When the land is sold to land developer, it becomes urban land. Finally, when the land is used for residential construction, it becomes urban and residential land.

Let us illustrate what we have considered so far. In Figure 1, we notice the chain of decisions, the changing state of the land and the decision agents involved.

Figure I

Chain of decisions, State of land and Decision agents

Chain of Decisions	Decision Agents	State of Land
Land is sold to the speculator from the farmer	Farmer Speculator	Rural land to potentially urban land
Land is sold to the builder	Speculator Builder	Potentially urban land to urban land
Builder builds developing	Builder Households	Urban land to residential land

The chain of land transactions may be in reality somewhat different from what the Figure shows. In some cases, land speculator may play the role of the land developer as well. In other cases, he may play at the same time the role of the three decision agents : speculator, developer and builder.

The distinction of the different channels of land transfer is of great importance to the extent that each decision-agent is governed by different sets of determinants. Furthermore, the capital gains are affected by the length of speculative land holding and the latter depends on whether or not the speculator combines his speculative roles with those of other decision units.

By and large, each decision unit is governed by three sets of determinants : the decision agents' characteristics, the site characteristics and the contextual factors. Figure 2 summarizes the components of these determinants.

Figure 2

Determinants of decision agent's behavior

I - Contextual factors

1. Socio-economic factors

a) Geographic location of urbanization

b) Economic structure of the community

c) Local housing demand

d) The local housing industry

2. Public policies

a) Provision of public utilities such as water, sewage, transportation, schools, etc.

b) Regulatory rules such as zoning, building codes, land, use plan and so on.

II - Decision agents' characteristics

1. Farmers

a) Type of farming

b) Scale of operation

c) Yield of farming

2. Speculator

a) Residence

b) Occupation

c) Ownership type (single or joint)

d) Length of time of land holding

e) Financial position

3. Builder and developer

a) Type of the firm

b) Scale of operation

c) Entrepreneurial approach

d) Life cycle of the firm (new or old)

4. Household characteristics

a) Life cycle

b) Family status

c) Education

d) Income

e) Occupation

III - Site characteristics

1. Physical characteristics

a) Tract size

b) Topography

c) Soil condition

d) Ground cover

2. Locational characteristics

a) Social location

b) Accessibility to urban activity places

c) Proximity to existing land development

d) Visual quality

e) Proximity to incompatible land use

- -

The foregoing list of determinants are by no mean exhaustive, but they are the main factors which affect in one way or another the process of land development.

The contextual factors are those which determine the special socio-economic conditions of a given locality. They are essentially macroscopic variables which distinguishe one locality from another so as to induce the decision agent to choose, other things being equal, a given locality.

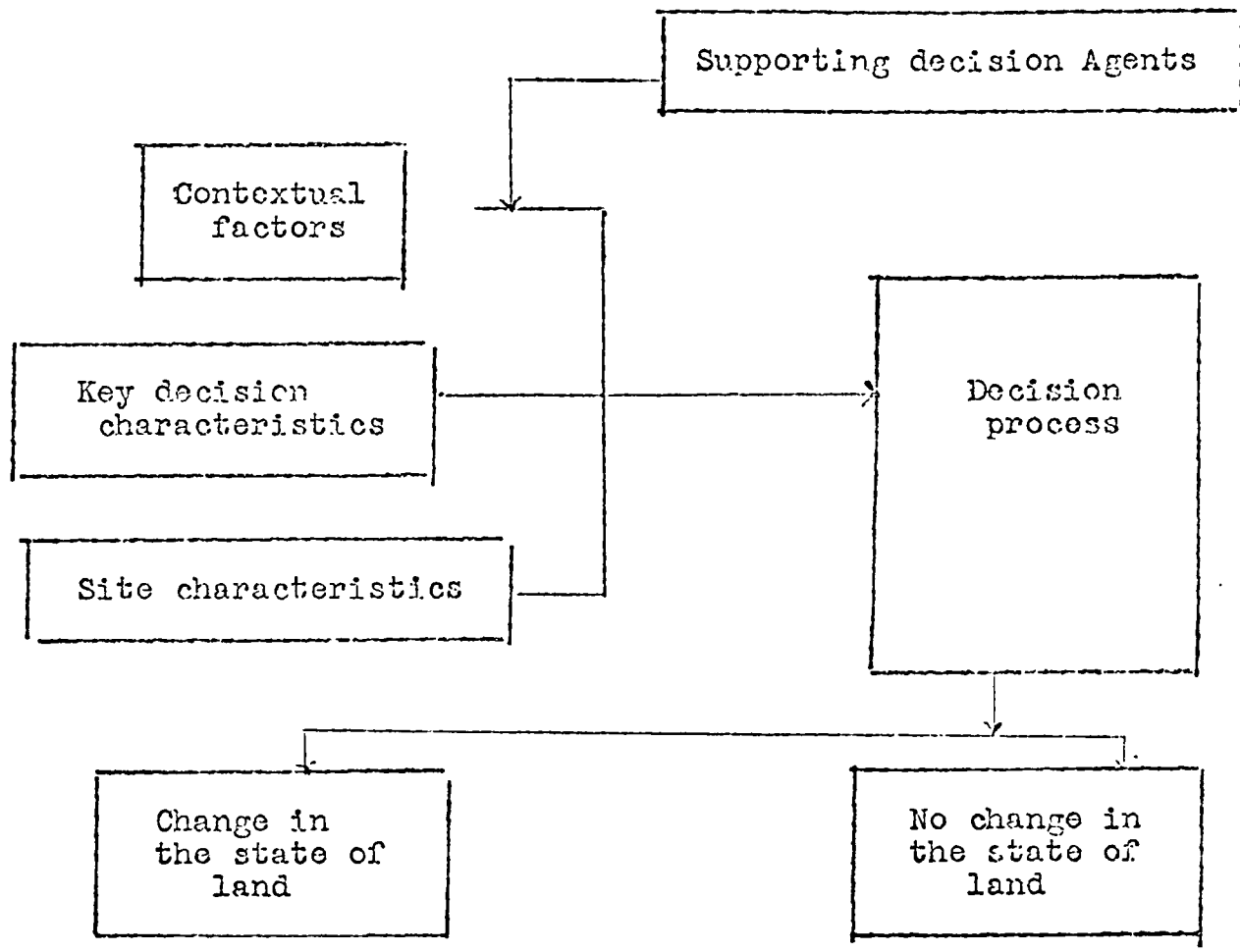
The three sets of variables affect the decision agent's decision to change the state of land and the transfer from one stage of land development to another (1). This is shown in Figure 3. It is shown that depending upon the decision agent's reaction to the determinants, land may or may not be transferred from one stage to another.

It should be added that the process of land development is also affected by a host of supporting decision agents such as financial institutions and real estate agents.

In short, the process of land development involves a series of transactions from one stage to another involving its transfers from one decision unit to another. There are mainly three stages of land development : the stage of potentially urban land, that of urban land and that of urban residential land. The main decision agents involved the farmer, the speculator, the land developer, the builder and the household.

Figure 3

Decision making process



2. Decision agents

2.1 Farmers

The reason for the farmer's sale of land is for maximization of profit. If we assume that the farmer is a rational decision agent, he is motivated by profit resulting from his sales of land. His decision depends on the difference between two streams of income : the stream of income he expects to obtain if he continues his farming and the stream of income he expects to obtain by investing the proceeds from his sale.

The first stream of his discounted income is :

$$V_f = \frac{\sum_{t=1}^{T} \left(Y_{ft} - C_{ft} \right)}{(1+r')^t} + \frac{\bar{V}_{ft}}{(1+r')^T} \qquad --(1)$$

V_f = the present value of farm land ;

Y_{ft} = gross annual farm income ;

C_{ft} = annual cost of farming ;

$\bar{V}_{ft}$ = the expected value of farm land at time "T" .

$\bar{r}$ = discount rate .

The farmer would be induced to sell his farm if V_{ft} is greater than the similarly discounted value of his investment of the proceeds of sale of land which we may denote by V_s . If $V_f > V_s$, he will sell and, if $V_f < V_s$, he will not sell. Now, the stream of farm income and costs depend on the scale of operation (X_{ft}) and the type of farming (S_f) . Hence equation (1) may be written :

$$V_{ft} = \frac{\sum_{t=1}^{T} \left[f\ (X_{ft}\ ,\ S_f) \right]}{(1+r')^t} + \frac{\bar{V}_{ft}}{(1+r')^T} \qquad --(2)$$

To the extent that the farmer believes in a low value of V_{ft} , the speculator can acquire farm land at very low costs. The farmer's tendency to underestimate V_{ft} may be explained not only by declining productivity of farming but also uncertainty resulting from the outward expansion of urbanized zones.

2.2 The speculator

The speculator decides to buy the farm land in function of his expected profit. The activity consists of buying land at a lower price

and sell it at a higher price at some future date.

The speculator's decision to buy land depends on his estimate of demand for land not only for residential but also non-residential purpose. His estimates of land demand depends on several variables. The contextual factors allow the speculator to determine the expected volume of urban development in the future in the light of the rate of growth of the local economy and the local government's regulations. It is interesting to note that according to Montreal city officials, total volume of land demand, at a gain time, is about equal to the total volume of developed land.

Now, given the total estimated land demand, the speculator chooses specific districts and localities for speculation in the light of site characteristics and his own characteristics. The most important social site characteristics is the degree of urbanization of contiguous areas and accessibility of urban activity areas. The physical site characteristics such as nearness to river and green belts also affect the speculator's choice of sites.

The size of the speculator is also important. A bigger firm with greater financial resources can disperse more easily his risks by buying up lands throughout the whole area. Furthermore, he can better estimate the true expected demand for land. Besides, he can minimize more easily the risks by exerting pressure on local governments (2).

The speculator's propensity to buy the land depends essentially on two considerations : costs of land acquisition and improvement (if needed) and the expected value of land.

If we denote the expected value of land at some future date as V_s^e , the cost of acquisition and improvement as C_s and C_o , respectively, the speculator's decision to buy land depends on :

$$V_s^e \gtrless C_s + C_o$$

The most uncertain element is the value of land expected by the speculator. By and large, it may be

assumed that V_s^e depends on the time period of land holding, contextual factors, site characteristics and the speculator's capacity to exert pressure on the local government. The cost of land acquisition depends on his ability to bargain with the farmer. The main items of other costs are interest payments and the cost of subdivision (if needed).

The period of speculative holding is determined by changes in contextual factors and its social site characteristics. As the urbanized zone expends towards speculation lands, the value of the latter tends to increase. The speculator can accelerate the valorization of his land by inducing the local government to alter zoning regulations.

If the speculator believes that the optimum value of land will be soon attained, he will subdivide his land. Kaiser has studied the phenomenon of land subdivision by regression techniques (3). The dependent variable to be explained is the location of subdivision. The contextual factors are represented by the availability of public utilities and zoning protection. The physical characteristics are the

proportion of marginal land and the proportion of poor soil. The social site characteristics are represented by socio-economic rank of the site ; distance to elementary schools,

central business districts, nearest main street ; the accessibility to employment areas ; and the amount of contiguous residential areas. Besides, as another independent variable, the author includes the speculator's characteristics such as the size of the firm. But the size of the firm does not enter explicitely into the equation as a separate variable ; instead, the author fits separate equations for different sizes. Finally, the author considers the type of markets defined in terms of the price of houses for which land is subdivided. The main conclusion of the study may be quoted :

> "Subdivision is more likely to occur at location of higher socio-economic rank, location having higher level of zoning protection, location having public utilities available and location slightly farther from arterial and major roads. In addition, subdivision is also slightly positively related to access to the central business districts and proximity to existing residential development. Those two relationships would simply suggest that development bigets more development." (4)

As for the size of the firm and the type of markets, it is interesting to note that the larger the firm and the more expensive the dwelling for which land is subdivided, the more important the site characteristics become in the developer's decision to subdivide (5). Finally, the author has examined the importance of the contextual factors. He has found that the impact of the site characteristics have differed in three localities studied.

Being encouraged by his findings, Kaiser goes on to pretend that his model can be used for forecasting locations of subdivision and for the redistribution of subdivision through the control of site characteristics. Briefly, a given locality is divided into a number of smaller zones in the input data. The model then calculates the probabilities of mutually exclusive outcomes for each zone. These probabilities are estimated by the techniques of discriminant analysis whose explicative variables are of course the site characteristics. These probabilities together with the input data are then submitted to computer mapping programs which will map out the output. The usefulness of this approach according to the author is :

> "... The use of site characteristics permit the uses to study the implication of different spatial policy alternatives in the extension of the water and sewer system, school location, segment of the transportation network and zoning districts." (6)

Furthermore, the model can be extended and converted into an allocation model by a probability model such as the Monte Carlo method or by a deterministic model.

Now, whether or not land is subdivided prior to its sale, the moment of the sale and the price depends on the difference between the immediate profit from the sale and the expected profit of deferred sale. The immediate profit is determined by the land price minus the cumulated cost of land holding. The price of land is the price paid initially paid to the farmer and capital gains cumulated during the period of land holding.

Let us define :

V_{st} = the present value of land ;

V_{so} = the cost of land acquisition ;

t = time period ;

α = the rate of growth of capital gains ;

β = the rate of increase in land holding cost.

Then, the land value of the immediate sale is :

$$V_{st} = V_{so}\, e^{t(\gamma+\beta)} \qquad \text{---- (4)}$$

The land value of deferred sale is the discounted value of land expected to be sold at a given future date.

$$V^{e}_{st} = V_{st}\, e^{-tr} \qquad \text{--- (5)}$$

The decision to sell or continue to hold land depends on the inequality :

$$V_{st} \gtrless V^{e}_{st} \qquad \text{- (6)}$$

Now given these basic factors such as the cost of land acquisition and land holding, the spatial distribution of land sales is affected by the same three sets of determinents (7). The landowner's characteristics include the place of the owner's residence and the type of land occupation. The site characteristics include the distance to the highest value corner the proportion of marginal land, the assessments and so on. The contextual characteristics were tested by estimating the equation in three different localities.

It was found that :

> "... with decreasing distance from the high value corner landowner characteristics become relatively less important and market value consideration and current taxes relatively more important in determining tendencies to sell or hold land." (8)

Another similar study was carried out by Kaiser and his company (9). The authors have used both multivariate and bivariate regression techniques. According to their findings, the tendency to sell is strongly associated with the length of time of land holding, the place of residence of the owner and whether or not the landowner is active or retired.

> "Least likely to sell are those living on the land, those who are not retired, those who own the land themselves, and those who at the start of the study period had held the land longer than 10 years but less than 4 years. Mostly likely to sell are those who are absentee owners, those who are retired, those who own the land jointly, and those who have their land either for a very short time as for a very long time." (10)

Furthermore, a parcel of land is more likely to be sold in a ten years' period if there is substantially nearby development. (11)

The implication of these empirical atudies is that while profit motivation looms large as an important determinant of land sales, personal circumstances and land oriented factors play the key role in the decision to sell land. (12) Another implication is that to the extent that their conclusions are reliable, the local government can control fairly well the spatial distribution of land development though its public investments :

> "The certainty and availability of future government action related to spatial extension of public investment such as highways, water and sewer system, and schools, can have an important stabilizing effect on the estimate of future value." (13)

To the extent that the decision to sell land and to develop it depends on the future value of land, the local government can effectively control the land development process. Furthermore, if services are already available, the future value of land would not be very different from the market value of land so that speculative holding would be discouraged." (14)

2.3 Builder-Developer

The transition from the stage of potential urban land to urban land is accomplished as soon as

land is sold by the speculator to the builder-developer. The final price of land is determined by the price asked by the speculator and the price offered by the builder-developer.

Weiss (15) points out that the developer selects the most favorable site on the basis of preliminary considerations, evaluate the feasibility of that site, and either purchase the site or move to evaluation of another site in a similar manner. (16)

The builder-developer may take either of two approaches : the market approach and the contact approach. Under the market approach, the developer first identifies the demand for a specific range of housing and then begins to search actively for lands. Under the contact approach the developer is called to attention by any of decision agents.

The decision to develop land depends on the decision to invest in residential development. The builder is guided in his decision by some established rules--of--thumb as to the ratio of the improved land lot to the value of residential package. It is observed that the ratio tends to increase with the price range of the house, because, more expensive houses tend

to have low density of the built-up area. The ratio varies from 15% for the low-period housing to 25% for more expensive housing in the areas studied.

However, the effect of land costs is not as important as the revenue effect of the site because the additional land cost is more than offset by the value which the consumer places upon it. (17)

The builder-developer determines the marketability of his products in the following manner. First, he estimates the share of the housing market accounted for by houses of a given price range. Second, he estimates the proportion of the specified price market accounted for by the locality in which he operates. Then finally, he estimates his share of the local market of a given price range. This can be simplified in an algebraic way :

H_{ij} = the share of the total area housing accounted for by the given locality "i" for a given price range "j" ;

H = the total area housing ;

$k_{ij} = H_{ij}/H$;

H_{ijm} = the share of H_{ij} accounted by the builder-developer "m" ;

$k_{ijm} = H_{ijm}/H_{ij}$;

$$H_{ij} = k_{ij}\,(H) \qquad \text{--- (7)}$$

$$H_{ijm} = k_{ijm}\,(H_{ij})$$

$$= (k_{ij})(k_{ijm})(H) \qquad \text{--- (8)}$$

In this way, the builder-developer can directly estimate his share if the total area housing is known.

Once the estimate of the marketability is estimated, the builder-developer examines the minimum lot size imposed by the local government and compares it with the optimal lot size. If the minimum size exceeds the optimal size, he may loose profit.

One important conclusion stemming from studies of the builder-developer's behavior is that cost considerations are not as important as revenue considerations. The difference in average cost of two similar lots varies much less than that in average revenue deriving from the same two lots. Hence, it is paramount that the determinants of differential revenues be identified. (18) The importance of revenue consideration is also pointed out by Racine. (19) Racine points out that in the Montreal area, the builder, instead of trying to reduce costs, tries to maximize price by selecting

those lots which are likely to be preferred by rich and professional groups.

The behavior of the builder-developer varies with his scale of operation. The large builder acts usually as an entrepreneur. The output of the builder is the product mix consisted of various elements.

Let the output mix be :

$$q\ (X_1, X_2 \text{ --- } X_k) \qquad \text{--- (9)}$$

Let the input combination be :

$$F_q\ (X_{k+1}\ \ X_{k+2}\ \ \text{--- } X_n) \qquad \text{-- (10)}$$

And let the flow of service rendered by the output mix be :

$$V = f\ (X_1\ ,\ X_2,\ \text{--- } X_k) \qquad \text{-- (11)}$$

Equation (9) shows that the builder combines various output components of the house such as comfort, quality of materials, physical layout, location and so on. Equation (10) represents the inputs of production such as capital, labor, construction materials. Equation (11) shows that the same product mix in (9) produces different services of the house.

It is theoretically possible to show the optimal output mix and the optimal input combinations by the use of isoquant techniques, but, it suffices, for the time being, to state that the optimal output and input combinations are such that the flow of service will maximize profit of the builder-developer, given the costs. The latter includes not only land acquisition costs but also land improvement and construction costs.

The optimal output mix can be expressed in a more specifed way. Given the value of the service package defined in (11), the optimal position of the builder is obtained by minimizing the cost function (12).

$$C = G\ (X_{k+1}\ ,\ X_{k+2}\ ---\ X_n) \qquad -- (12)$$

that is to say, the builder-developer will minimize (11) subject to (12).

To summarize, the builder-developer is motivated by profit, and cost considerations are less important than income considerations. The income deriving from a given housing project depends on the contextual factors and the consumer preference.

2.4 Household

Although the household as a decision agent is not directly involved in the process of land development, it merits a few words because its preference affects the behavior of the other decision agents.

Various writers have studied the behavior of household related to housing. However, since our aim is to see how household decision is related to the spatial distribution of land development, we shall focus on those studies which examine the motivations and the process of the household's choice of a particular location.

Ross (20) pretends that household's decision to move is made by steps :

a) the decision to leave the old dwelling ;

b) the search for a new home and

c) the choosing among the alternative dwellings brought to his attention.

Arminger's model is a little more elaborate. (21). The author dicerns the following steps :

a) the formation of mobility desire ;

b) the formation of intention to move ;

c) a built-up of expectation ;

d) the elimination of alternative sites ;

e) and the decision to relocate.

The mobility desire is affected by push and pull factors. The push factors induce the household to move, while the pull factors weakens the desire to move. Various factors work on the household desire to move : demographic factors (22), sociological factors (23) and a host of others. Arminger regroups all these factors into two groups : the characteristics of the household and (b) the complaints and the need of households. The former includes ownership tenure, life cycle, family size and income. The life cycle has been found to be of great importance by Rossi and Beyer (24). The latter suggests four different life cycle types :

a) the young couple with women under 35 and no children ;

b) the founding family (all children under 8) ;

c) the expanding family (some children between 8-18) ;

d) and the contracting family.

On the other hand, Bell (25) stresses the life styles : those who emphasize family function, those who are motivated by success in business, those who emphasize on "living-it-up".

The chief push factors (complaints) which contributes to the desire to move are disatisfaction with limited space, about the neighborhood and rental costs. (26) Our own study of the Sherbrooke area confirms this. The pull factors are greater in number. These include, for example, the attachment to the familiar neighborhood. These pull and push factors interact each other so that they lead the household to a threshold point.

Once the desire to move is formed, the household intends to move. The expectation is built-up on the basis of financial considerations, dwelling characteristics, social environment of the site and physical characteristics of the neighborhood (27). Many other factors are also taken into consideration. The final choice of a given dwelling is a result of a series of compromises.

> "Thus, the housing is not only a compromise among location, tenure and dwelling, it is also a compromise within the dwelling -- among equipment, design, state of repair and space -- with the cost comparatively limiting factor which makes the other choice necessary --- stated preference may be and often are severely modified on the housing market." (23)

The sex has been also found to be a significant variable. Rossi points out that for the male, the price, downpayment, heating equipment and construction are more important, while for women, the size of the bedrooms, eating space and noise are relatively important. (29)

In fact, the compromise is between pull and push factors and the trade-off point is reached. The closeness to activities centers is found to be an important element of the compromise. It is interesting to note that the household is not sensitive to the house price, for it is ready to make sacrifice other expenses to buy a new home.

Previous housing experiences cannot be ignored either. According to Arminger's study household buying for the first time are primarily concerned with more space and privacy. His search for a new home

relies on friends and his own effort to look around himself. He also put emphasis on social aspects of the new location. The behavior of the household varies depending on whether or not it is a rooted household in the area or a new comer. The non-rooted household behaves more like a Marshallian economic man while the rooted household behaves more like a veblian social psychological model. Furthermore, the new comer tends to locate in suburban areas and is more cost conscious. (30).

In short, the household's choice of a new residential location depends on a series of complex interactions of a great many factors. However, we may mention the chief categories of these factors : the household characteristics, accessibility to socio-economic activities, physical and social environment, the characteristics of the dwelling, financial considerations and of course the contextual factors. This raises the question of whether or not the consumer is rational in his choice. Beyer observes :

> "... many families... enter into arrangement for purchasing a home without being fully aware of the extent of the total commitment in which they are becoming involved. Many may simply consider the traditional rules of thumb which they have heard about ... and feel that if they are within the limit of those rules they are making a well-considered and sound decision." (31)

3. Summary

The land development is better understood if we identify a series of stages involved in the course of land development and the various decision agents involved in the process. We have identified three stages :

a) the sales of lands by the original owner (usually the farmer) to the land speculator ;

b) the developer's purchase of land from the speculator ;

c) and the purchase of land by the builder.

Corresponding to these three stages of land development, land becomes potentially urban, urban and residential.

There are five key decision units : the farmer, the speculator, the land developer, the builder and the consumer. Often, the builder and the developer are the same person, in which case there are only four key decision agents. The process of land development

depends also on supporting decision agents such as real estate brokers and financial institutions.

Each of these decision agents behave differently in order to attain their objectives. By and large, their behavior is governed by the following three sets of factors : the site characteristics, the agents' characteristics and the contextual factors.

The value of land and its spatial distribution is determined by the interaction of those factors and the reaction of decision agents to them.

If there is any such thing as general theory of land development, it may be best formulated by formalizing the behavior of each of the decision agents and deducing the logical outcomes of their behavior on different aspects of land development.

CHAPTER II

THE MARKET ANALYSIS APPROACH :

(MACROECONOMIC APPROACH)

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In the previous chapter, we have reviewed those studies which are intended to examine the roles played by various individuals and institutions involved in the process of land development. The approach was essentially microeconomic. The interaction between various decision agents related to land is reflected in the value of land and its location. It is, of course, difficult to spell out the way in which the land value is formed by the decision agents' decisions. In other words, as usual, it is a difficult task to specify the way in which microeconomic variables give birth to macroeconomic quantities. Nevertheless, it is worthwhile to offer a plausible empirical explanation of the value of land, for such explanation offers some guide to urban policies and planning.

1. Theory

Most of the empirical studies discussed in this chapter is inspired by Alonso's important work. "Location and Land use." (1) Alonso's model begins with the determination of agricultural land rent and land use. It is assumed that land is featurless plain, that the farm yield per acre is given, that the crop is given and the cost of farm operation is also given. On the other hand, it is assumed that the transport cost varies directly with distance from the market place. The land rent, that is, the profit per unit of farm therefore declines as the distance from the market place increases. The curve which relates the rent to the distance is called the farm bid-rent curve. This is shown in the following figure.

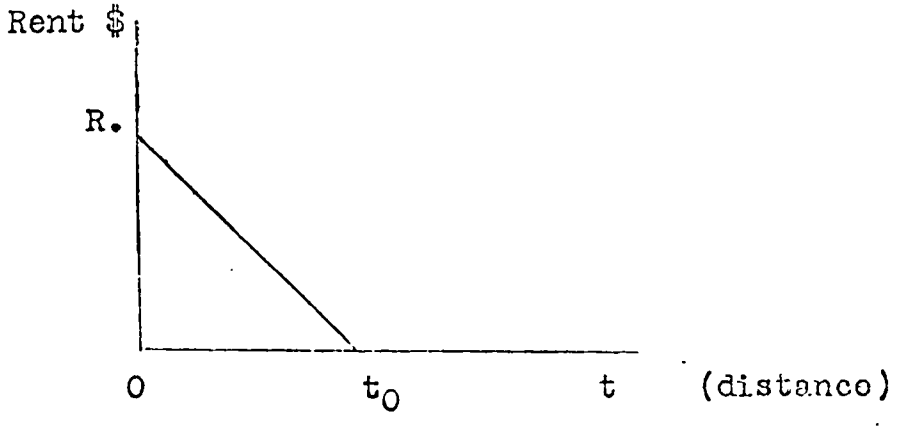

Figure : Farm rent curve

At the location t_o, rent is zero because of high transport cost. At the origin which represents the market place, rent is the highest because the transport cost is zero. The curve relating rent to distance is the rent curve which will ensure normal profit of farming if competition is perfect.

The notion of the farm rent-bid curve is then extended not only to residential land use but also to other land uses. For example, the residential bid-price curve is defined as a "set of prices for land the individual could pay at various distances while deriving a constant level of satisfaction ..." (2) The extension of the notion of farm rent-bid curve to all types of land uses can be used to determine the equilibrium of the land market and resulting rent structure and spatial distribution of land uses. The chief implication of Alonso's theory is that the value of land is the highest at the center of economic activities and decreases gradually as one moves away from the center.

Models inspired from Alonso's theory have been tested by various writers. (3) According to

Seyfried for a metropolitan area having a broad economic base, the rent surface would reveal a hierarchy of cones, nodes or apex resulting from nucleation of competing economic functions. By and large, the more accessible the site, the greater nucleation and the steeper the stope of the rent gradiant. Seyfried explains, in fact, that the increasing accessibility owing to better roads and transportation means has led to a situation in which many firms are located along the transportation routes. Finally, the competition in the land market leads to the best land use and the structure of urban land can be quantified by the land value or rent surface determined by market accessibility.

> "Assuming a competitive market, this theory leads to the conclusion born out by the results of the experiment : that market forces result in a structure of site value unit highest value occuring at the location with maximum market accessibility or lowest transport cost." (4)

Brigham further specifies the rent-bid curve or surface. Instead of its being smooth curve, it may have a series of kinks and this is explained by the tendency of decentralization of economic activity centers in the suburbs. This view is enhanced by Stegman.

> "There can be no question but that the central cities of to-day are at a competitive disadvantage compared with the suburbs ..." (5)

Harris pays special attention to the residential land market. He views residential location as an attempt to establish an equilibrium between many interests which the consumer has.

> "... residential location in the urban land market seeks to achieve an equilibrium between their expenditures for residential accommodations, their use of access to other opportunities, especially employment, and their expenditures on all other commodities. It is especially emphasized that utilities from space and accessibility are a joint outcome of the locational decision.., the possession of land in the central locations confers a transportation advantage and consequent this land enjoys higher rents in direct relation to the savings on transportation costs and other inconveniences." (6)

Harris' statement is similar to Alonso's. (7)

2. Dependent variables

The dependent variable that is, the variable which represents the phenomenon to be explained, varies from one study to another.

Mace and her company use a rather complicated dependent variable (8) :

X_1 = appraised building value (replacement cost less depreciation) ;

X_2 = gross annual rent ;

X_3 = real estate taxes which is defined as t X_2 where t (5%) is the tax rate ;

X_4 = management cost which is definied to be m X_2 where m stands for a given percentage (5%) ;

X_5 = insurance cost which is definied to be i X_1 where "i" is a given proportion. In fact, the "i" is $0.40 per $100 for 80% of the property value ;

$X_6 = X_1 - (X_2 + X_3 + X_4 + X_5)$ = net income before depreciation ;

X_7 = interest on improvement = 45% of X_1 ;

X_8 = depreciation = 2% of X_1 ;

$X_9 = X_6 - (X_7 + X_8)$ = net income attributable to land ;

Y = land value = $X_8 \div$ the capitalization rate (6)

It can be shown that :

$$Y = \frac{X_2 (1 - t - m) - X_1 (i + c + d)}{C}$$

Thus, the authors estimate the land value by means of the land residual method. This gives priority to the claims of invostor and tenents, by substracting these from the total income produced by the land and building in order to arrive at residual income attributable to the land. The capitalization rate is then applied to arrive at the land value.

Weiss and her company use as dependent variable land value and land use. (9) Instead of using the appraised value, the authors use the index of classes of land value. Soyfried (10) uses a similar dependent variable as Mace. On the other hand, Brigham's dependent variable is the simple assessed value, but he takes into account of different values resulting from different land uses.

Knetsch & Parrot (11) use as dependent variable the appraised land value confirmed by experts. Furthermore, they separate land value from the value of improvement and development. They have accomplished this separation by entering as independent variable the appraised value of buildings on land and costs of land development. This is an interesting procedure, for if improvement and development value is simply deducted from gross land value, this amounts to the supposition that cost dollar of appraised value of building or each dollar of development cost would be reflected at exactly one dollar in the final sale price. (12)

3. Independent variables

A great number of independent variables are used by various writers. But, most of the studies seem to put emphasis on the accessibility variable.

Brigham (13) proposes a variable called the accessibility potential of the site :

P_i = the accessibility potential of the "i" the site ;

E_j = total employment in the "j" the work place ;

D_y = the distance between the "i" the site and "j" the work place ;

$$P_i = \sum_{j=i}^{n} \frac{E_j}{a + b\ D_y^c}$$

Thus, the employment accessibility potential of site varies directly with employment opportunities and inversely with the distance between the site and employment opportunities.

McDaniel uses a similar concept. (14)

P_1 = population of city "1" ;

P_2 = population of city "2" ;

d_{12} = distance between the two cities ;

T_{12} = expected number of telephone calls ;

$$T_{12} = \frac{P_1 \times P_2}{d_{12}}$$

This gives a composite independent variable of what the author calls a "gravity model".

Hansen's model (15) is given by :

$$_1A_2 = {}^{S_2}/_{T_{1-2}}$$

$_1A_2$ = accessibility at zone 1 to activity at zone 2 ;

S_2 = the size of activities at zone 2 ;

T_{1-2} = travel time or distance .

To generalize :

$$A_1 = \frac{S_2}{T_{1-2}^X} + \frac{S_3}{T_{1-3}^X} + - - - + \frac{S_n}{T_{1-2}^X}$$

where X represents some constant. Hansen gives a series of values of X : for school trip it is 2.0 ; for shopping trip, 2.0 ; social trip, 1.0 ; and work trip, 0.9 .

Furthermore, Hansen goes on to propose what he calls development ratio which is defined as the ratio of actual development, D_A , on probable development D_p . The latter is, in fact, represented by the distribution of population in proportion to vacant land at each zone. The author actually uses a more operational model. The development ratio of a given zone "i" is defined as :

$D_i = K A_i^*$ where A^* is the accessibility index. Then, he estimates the ratio of residential development at zone "i" to that in the whole metropolitan area P_t .

$$\frac{P_i}{P_t} = K_i A_i^{*} / \sum_i^n A_i^{2.7} K_i$$

Knetsch and Parrot (16) have their words to say. The accessibility is compared of : the size of population centers in the area, the diminishing influence of centers with increasing distance, the possible difference of income level or economic activity in various areas, and alternative lake that may be available to people living in different sites. The cost element is added in view of the fact that their studies are interested in the value of land around a lake.

U = urban value of land ;

L_i = the lake value for city "i" which is the sum of lakes in the area divided by the driving time to power of 3/2 ;

$\bar{L}$ = the average value for all cities in the region ;

R_i = retail sales in city "i" ;

D_i = distance to i , the city

$$U = \sum_{i=1}^{n} \left(\frac{\bar{L}}{L_i} \right) \left(\frac{R_i}{D_i^{3/2}} \right)$$

This gives a weighted land value.

Thus, the notion of accessibility has attracted the attention of several writers. It is well defined by Hansen :

> "... accessibility is a measurement of the spatial distribution of activities about a point, adjusted for ability and the desire of people or firms to overcome spatial separation." (17)

There are many other independent variables used in the studies. For exemple, Brigham (18) tests a variable for amenities. This is a variable quantified by a series of social rank established by those who are well familiar with the area. The ordinal ranking of each individual person participing in the experiment was scaled from 1 to 100 assigning his rank percentile to each site -- the most desirable 1% of the sites was given a value of 100 . The percentiles of ranking are then aggregated, which yields a numerical index of amenities.

Brigham (19) further proposes what he calls historical factor referring to those developed land which would not have been developed had it not been for rapid growth of the city.

4. Method

Most of the authors use the multiple regression techniques. This contrasts with the method used by the authors reviewed in the first chapter. It may be argued that the multiple regression yields only the average trend of a given phenomenon and that they are subject to numerous technical difficulties such as multi-collinearity, heteroscedasticity, and non-linearity of the function, to name a few. It can be argued that it yields only macroeconomic view of the land market without being able to discern consumer's preference and the process of decision making of various decision units. On the other hand, it must be admitted that if the model is properly specified, the regression techniques can be a powerful tool for the estimation of the structure of the land market and hence, for urban planning.

5. Empirical findings

Seyfried's results can be summarized in term of the equation :

$$Y = (5.272)X^{-0.807}$$

where Y stands for the appraised market value of land and X , for the distance in feet from the highest rent corner. The equation shows that the elasticity of land value with respect to the distance is minus 0.807, that is as the distance increases by one per cent, land value deceases by 0.8 per cent.

Seyfried seems to be surprised to find that, in Seatle, despite the development of shopping centers, the central business district (CBD) still maintains the highest rent, and ventures an explanation :

> "Logical explanation might be that the internal transportation system is adequate to provide the accessibility to the central business district to maintain its economic dominance." (20)

Brigham has fitted the 5-block moving averages of land value per square foot for single-family properties on each ray. The use of moving averages was to eliminate spurious variations of land value. Brigham has found also a negative relation between land value and distance from the CBD, and observes :

> "... land value falls by about four or five cents per square foot for every one mile increase in distance from the CBD after amenity levels and other value influencing factors are taken into consideration." (21)

It is interesting to note that the dummy variable for hilly areas has turned out with a negative sign. The author attributes this to the bias induced by the inclusion of undeveloped land in the area.

Several other studies reviewed have come to the conclusion that land value varies inversely with the distance from those areas where socio-economic activities are concentrated, particularly the CBD. This confirms that basic hypothesis put forward by Alonso. On the other hand, most of these studies are related to the value of developed land and few authors have examined the variation of suburban land. It is hoped therefore that some studies will be carried out in this area.

CHAPTER III

LAND SPECULATION

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We have already considered the land speculator's role in the process of land development. However, since it has been long argued that the spiral of land value is due to land speculation and since there seems to be undue prejudice against land speculation, we have thought proper to insert a separate chapter.

1. Definition of land speculation

MacKay simply defines land speculation in these terms :

> "In essence, speculation consists of buying cheap and selling dear. A speculator buys a commodity with the expectation that at some time in the future, the price will rise and will be able to dispose of his holding at profit." (1)

This definition is a matter of common sense, but it is quoted to underline the fact that speculation would not place unless one expects to make profit. Hence, it is important to examine why land speculator expects to make profit.

2. An explanation

Explanations of land speculation offered by various writers may be summarized. First, the good involved -- land -- is highly heterogeneous and differentiated so that the demand for it tends to be little elastic. This means that the landholder finds no advantage in lowering price, for doing so he would loose profit. Furthermore, being never sure of the optimal size of land because of volatile nature of consumer demand for land, the speculator is faced with the difficult situation in which he has to match the right size of land at the right place for the right buyer. Hence the amount of risks is reflected in the price of land. Clawson (2) observes that subdivision of a large tract often creates "plottage" value, which is at its peak when the size of tract coincides with the size best suited for the given use. In short, the heterogeneity and the differentiation of land combined with difficult buyer's preference create the first type of risk, namely, the demand risk.

The second type of risk arises from the fact that demand for land is derevied from the demand for

housing and non-housing purposes. Hence, unless the speculator can foresee accurately the change in the primary demand, he is subject to risks.

The third kind of risk is related to local government policies. These policies may affect unexpectedly the value of land through changes in zoning, taxes, building codes and particularly the provision of utilities.

Facing these risks, the speculator has to make proper judgment regarding the amount and the location of land tracts he may wish to hold. He may make wrong judgment, in which case, a loss is inevitable. In fact, Clawson observes that profit in holding suburban land arises entirely out of error in concensus or out of individual judgment more astute than the concensus (3). In the similar vein, the Planning Department of Montreal seems to find the source of speculative profit in disorderly and incoherent urban expansion.

In short, the very nature of the land market and the necessity of taking risks explain land speculation and high profit.

3. The amount of speculative land

The amount of speculative landholding, in the absence of clear direction of expected urban expansion, is determined by the distance separating the limit of the developed area and the expected limit of urban expansion in a given time period. Suppose that the whole area is represented by the rectangle shown below.

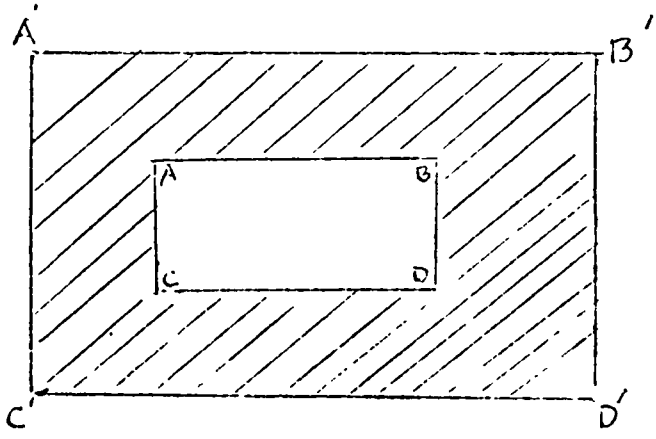

Figure 1 - Urban expansion

For the sake of argument, assume that the developed area is A B C D and that the expected limit of urban expansion is A'B'C'D'. Assume further that the speculator does not know in which way an urban expansion will take place under these assumptions, the whole shaded area -- A'B'C'D'

minus A B C D -- has the equal probability of being developed and it yields the same amount of speculative land. During the time period, only a fraction of the speculative area will be actually brought into development.

The oversimplied exercise above gives some clue to the fact that the amount of speculative land continues to increase much more than the amount actually needed in a given period of time. (6) The edge of the speculative zone lies, at a given time, around the area where the price increases rapidly. This crest of the wave of urban expansion area, on the average was about 14 miles out from the city of Montreal in 1964, and about 12 miles in 1956, and it is expected be about 18 miles away in 1976. (7)

At any rate, the simple illustration implies that the amount of speculative land, at a given time, may far exceed a what is actually needed. In 1956, there were 190,000 acres of speculative land in the Montreal area as against 65,000 acres of developed area, or ratio of 2.8 to 1.0. In 1964, there were 250,000 acres of speculative land as against 120,000 acres of developed area, or ratio of 2.1 to 1.0 .

In 1976, according to the City of Montreal, there will be 355,000 acres of speculative land as against 230,000 acres of developed land, or a ratio of 1.6 to 1.0.

4. Consequences of land speculation

The often discussed consequences of land speculation are related to suburban sprawl, urban blight land, direct and indirect costs, the effect on agriculture and the difficulty in urban planning.

It is by and large admitted that land speculation leads to suburban sprawl, that is, disorganized and discontinuous development of land at the periphery of developed areas. In the absence of proper planning, the speculator seeks to minimize land acquisition cost by moving farther from the developed area. This explains discontinuous land development. It is, of course, possible that such development be also explained by the fact that areas near the developed zone are not suitable for certain types of projects because of unsuitable lot size, multiple ownerships and the low standard of construction of existing houses.

Besides, the process of site selection is very complicated. The land speculator has to consider not only the overall market demand but also the availability of public services, consumer preference and many other factors outlined in Chapter One. Under these circumstances, one has to admit with Clawson that "one should in fact anticipate exactly what we have experienced." (8) In other words, we should not blame only the speculator for urban sprawl.

On the other hand, Harvey and Clark attribute partially any way the phenomenon of urban sprawl to lack of coordination of speculation, not the speculation itself.

> "But, speculation is a motivation of growth process. All incremental addition to the urban fringe are speculative ventures. The independence of placement and timing of these ventures permit a sprawl pattern. It is the lack of coordination of the decision to speculate which procedures sprawl and not the speculation itself." (9)

The same authors find several reasons for the phenomenon of urban sprawl. To begin with, the development of a highway system has often created land parcels economically unsuited to farming or housing and led to unfortunate heterogeneity of land use. (10)

They also share the view that multiple ownership of land leads to sprawl. (11) Another reason is that sometimes landowners sell their land in small pieces for specific purpose such as repayment of old debts so that even if wanted, the speculator would not be able to buy land of a right size at the right place. Finally, they argue that speculation occurs not because the price mechanism does not work but it works too well.

The Planning Department of Montreal seems to believe that the speculator is responsible for urban blight land. Under the provincial tax law, the land labelled as "farm land" is subject to low tax rate than land specified as "urban". In order to take advantage of this law, the speculator tends to hold vacant land labelled farm land, although no farming takes place. This explains, according to the officials, the existence of large vacant land in the vicinity of the Montreal area. (12)

We may discern two kinds of cost of land speculation : direct and indirect costs. First of all, the consumer pays a much higher price for land under speculation than he would in the absence of

land speculation. The indirect costs are several in kind. The consumer pays the cost of speculative holding. The Montreal Planning Department estimates that the amount of investment in speculative land is about $600 million and its annual holding cost is about $40 million compared to annual housing investment of $60 million a year. The speculator tries to shift the holding costs to the consumer. (13)

Furthermore, speculation leads to a sheer waste from the view point of the community as a whole. It is remarkarly unproductive (14).

The consequence of farming can be far reaching. As the area affected by land speculation approaches, the farmer is forced to make decision to move out or remain in farming by comparing the yields of farming and the price offered by the speculation. This creates uncertainty as to the future feasibility of new investment in farming. True, some farmers have gained a lot owing the speculation, but the wave of speculation takes a long time to pass by their farm lands. It has been estimated that urban expansion proceeds at rate of 3 miles per decades. (15)

The deal with the land speculator leads to several other types of uncertainty. In a deal involving large tracts of land, the farmer receives a very small amount of downpayment and he is not always assured of repayment once he moves away. He can, of course, take court action, but he is not always in the position to afford a lawyer.

Another kind of uncertainty is imposed on those farmers who remain on farms. As some farmers leave, the social and economic life of the rural community becomes disorganized and the remaining farmers begin to doubt their survival. Besides, as neighbouring farm lands become abandoned, not only the weed control becomes difficult and expensive but also community services cost must be shared by fewer people. In short, for a farmer, urban development and land speculation are a mixed blessing, indeed.

It was mentioned earlier that land speculation makes town planning difficult. There are two aspects of the relation between land speculation and town planning. In the absence of medium term and long range planning, speculation is inevitable. Another aspect is that town planning is difficult at the

present time for the simple reason that the great bulk of land is already held by the speculator. Thus, we have a vicious circle : speculation flourishes because there is no planning ; there is no planning because speculation flourishes. The only solution would be that of breaking somehow the vicious circle.

Can anything be done to fight speculation ? Essentially there are two approaches one can consider. First, one can impose direct measures on the speculator, for example, nationalization of land. The other approach consists in controlling determinants of the speculator's behavior. However, either of the two approaches requires thorough knowledge of the speculator's behavior. The following section attempts therefore to offer at least a theoretical explanation of the speculator's behavior.

5. A theory of the speculator's behavior

In Chapter One, we have briefly considered the speculator's behavior. In this section, a little more elaborate discussion is offered.

As the first approximation, we assume perfect competition and rational economic behavior of the speculator. This means that the number of sellers and buyers are very large, that the size of firm is very small, and that diffusion of the knowledge of market conditions is perfect, and that the good is homogeneous. Furthermore, it is assumed that the seller and the buyer act in order to optimalize their respective position, that is, they try to minimize cost, maximize profit or maximize satisfaction. Under these circumstances, every one makes only normal profit and, moreover, since there is no uncertainty, no speculation can take place.

In other words, if the land market were governed by pure competition, the price mechanism will ensure instantaneous adjustment of make forces in such a way that no one can expect to make speculative gains. This implies, therefore, that speculation takes place precisely because the land market is not characterized by pure competition.

It is not hard to see that in reality, what we have in the land market is far from being

perfect competition. For example, in the City of Longueuil (former Jacques-Cartier), the bulk of landholding is monopolized by a handful group of promoters. The good involved -- land -- is highly differentiated and heterogeneous in every aspect. It is a common knowledge that the consumer is totally unfamiliar with land market conditions. This also means that the diffusion of information concerning land transaction is very limited.

In fact, the image of the land market is closer to that of monopolistic or oligopolistic competition than to that of pure competition. To the extent that oligopolistic market is characterized by uncertainties, the speculator has to make his decision under a series of difficult constraints.

It was shown earlier that the speculator's objective is to maximize the sale price and minimize land costs. Now, unlike lands used non-speculative use, say rental purpose, the speculative land in many cases does not bring in a stream of income, so that in order to make the same profit as the rental land, the sale price of the speculative land must be much higher than the value of land for rental purpose.

To show this :

V_t^s = the present value of the speculative land ;

V_t^R = the present value of the rental land ;

t = time. 0, 1, 2, --- T ;

T = the date of the sale ;

i = the discount rate .

By definition :

$$V_t^s = \frac{Y_T}{(1+i)^T} \qquad \text{--- (1)}$$

$$V_t^R = \sum \frac{Y_b}{(1+i')^t}$$

$$= V_t^s + \sum \frac{Y_{T-1}}{(1+i)^{T-1}} \qquad \text{--- (2)}$$

The foregoing two equations assume that the stream of land value income is constant over the period. They show that in this case, the present value of the speculative land is smaller than the rental land. This is because of the loss of land income resulting from idle holding of land. The speculator, therefore, how to be assured of a relatively high sale price.

Furthermore, the loss of liquidity resulting from investment means the expectation of even a higher sale price. In short, in the absence of conditions of perfect competition, the success of land speculation depends on the speculator's ability to guess the right sale price of land.

Although it is of limited importance, costs involved in speculation must be considered. Little is known about the cost of speculative land holding. However, owing to a study conducted recently in the Montreal area, some information is available at least for the mortgages. In fact, in Longueuil area, the downpayment varies between 33% to 55% of the land price and interest rate is surprisingly low, not much higher than the insured mortgage rate. The period of amortization varies between 5 to 15 years. The second mortgage rate is about 12 to 14%. The taxes vary between $400 to $1,000 per acre on speculative land while it is about $100 per farm land. This explains why the speculator tends to hold land labelled as a "farm land".

According to a study which cannot be quoted here, the speculator's cost including taxes, insurance and all other relevant items increased between 1953 to 1966 by only 135%, while the land price has risen by 25 times and construction cost, by 1.36 times. The implication is that not only cost is of relatively minor importance but also it has been much more stable than the land price.

There is another cost which the speculator must consider, namely, the loss of gains of investment that he would have made, had he not bought the land. We may include also risk premium, the cost of liquidity loss. (16)

The foregoing argument may be summarized by the following equation :

$$PV = \sum_{t=1}^{T} \frac{Y_t - E_t}{(1+i)^t} + \frac{EV}{(1+i)^T} \qquad \text{--- (3)}$$

PV = the present value of land ;

$Y_t - E_t$ = net income at a given year ;

EV = expected sales price ;

i = the discount rate .

The equation implies that the present value of land is equal to the stream of expected net income and discounted expected sale price. In reality, Y_t is close to zero as it was mentioned earlier. The cost element, E_t is of minor importance. Hence, what counts is expected sale price, EV .

Whether or not the speculator decides to dispose of his land immediately or to continue to hold it depends on the difference between the market value of the expected value (present). If the former exceeds the latter, land will be sold; in the contrary case, land will be held.

The magniture of EV depends essentially on the speculator's subjected appreciation of a series of possible changes. He will consider the expansion of the built-up area, the provision of public services, changes of possible government regulations and, of course, changes in land demand. The value of EV depends on psychological disposition of the speculator.

It seems paramount to any policy maker in this area to understand how the subjective value of EV is actually formed. It is essentially the mathematical expectation of conditional probabilities of EV, given a host of relevant variables which are taken into account by the speculator in his mathematical expectation. One could, for example, envisage the following form of mathematical equation :

$$E\ (EV\ X_1\ ,\ X_2\ ,\ ---\ X\ ) = A\ X_1^{\ 1}\ X_2^{\ 2}\ ---\ X \qquad ---\ (4)$$

where X_1 ---- X represent exogeneous variables and the random error term. Equation (4) can be directly estimated by the regression techniques. The dependent variable can be the actually observed sale price. Once equation (4) is estimated by using a suitable logit model or provit model it is possible to estimate the probability of price increase.

The speculator facing uncertain outcome of his investment would take several measures in order to reduce the coefficient of uncertainty. First, land may be sold back and forth among associates simply to inflate the price. This practice was confirmed in our field survey. This practice is

particularly frequent for expropriated lands. The objective is to create public evidence of value increase which can be effectively used during expropriation hearings. It is understandable that great care is taken in order not to reveal the relationship among those involved in the fictive transactions. Clawson observes :

> "Land Speculators and the "Court House" gang are sometimes the same people, or at least, not unknown to each other." (12)

Second, the speculator exerts pressure on municipal authorities.

> "The effect to increase profit may be made by trying to improve sale prospects for a parcel : pressure is exerted on municipal authorities to install services, to change the zonage, etc." (18)

The effort to increase profit may take another form. The effort may take the form of withholding the immediate sale of a particular parcel whose chances of ultimate profitable sale seem particularly good : in effect, increasing the holding period and accepting the attendant increase in costs in the hope taht he will do much better. (19)

These are then some of the salient features of the process of speculation.

Furthermore, Smith (20) points out that given the land price, the probability of selling or holding land depends also on the characteristics of the speculator. By and large, professional and financially sound speculators tend to sell more easily, owing perhaps to their easier access to market information.

It is interesting to point out that the change in land value follows a certain cycle. Smith pretends that one can discern three cycles of land value :

a) the period of gradual income in price ;

b) that of rapid acceleration ;

c) and that of gradual increase .

An intelligent speculator would try to sell at the second period which takes about 10 years. This pretension was more or less confirmed in our field study.

In summary, we have tried to understand the organic and dynamic anatomy of the process of land speculation in the light of investment theory and, we have found that this theory can be further extended to better analyse the process. The main point is that despite the complexity of the phenomenon and contrary to common belief, the process of land speculation appears sufficiently systematic and logical for the use of known estimation techniques and perhaps one can even make prediction of land value and sales.

This leads to the final section concerning land policies.

6. Land Policies

What can be done to attenuate speculation of land, if not eliminate it ? A large number of people have ventured solutions. We may group them under three headings. First, there are those who seem to believe that the Government's direct control in forms of tax increase, holding cost and so on can insure an adequate supply of land at lower price. Then, there are those who favor a set of indirect measures

which will affect the expected value of land. Finally, some are bold enough to propose outright nationalization of land. There are, of course, many others, but they do not seem to warrant an appraisal.

In the area of municipal taxes, the discussion has been centered on the three main points : the differential tax rate on farm and urban land, the differential tax rate on urban land and land improvement and taxes associated with the development value. (21)

Although the municipal tax represents a small portion of land value, it constitutes none the less a major part of land holding cost. In fact, "the cost of taxes more often than not exceeds current income, though taxes as a percentage of the market value of the land may be minimal." (22)

It is generally admitted that the present tax system is not realistic in the sense that speculative land is taxed at a rate applicable to farm land, while the speculator is doing no farming.

Bryant suggests that as soon as land becomes urban, it should be taxed at a special rate. (24)

It has been also pointed out that the present tax system in North America favors land speculation and penalizes land development. Thus, Burrough observes :

> "Raw acreage rural land nearer urban periphery and vacant building lots are said to be assessed for tax purposes at less than a fifth of their market value, whereas non-farm residential property mostly one-family house is assessed at nearly third of market value." (25)

This means that the lot owner pays only 62 per cent in real estate taxes for every dollar paid by the home-owner next door. In fact, Burrough argues that this tax system favors the development of slum district.

> "Tax policies of the Federal Government in the United States have prolonged the life of building and discouraged replacement of building. This has perpetuated the life of slums." (26)

Smith seems to agree :

> "Over taxation of improvement makes slum areas the most profitable of all housing investment. There is no incentive to improve the property.

> On the other hand, undertaxation of land makes investment is suburdan land one of the most profitable investment under the present system of federal tax system." (27)

The situation in Canada is not very much different. As a remedy, it has been proposed that taxes should be increased on underdeveloped land, while tax rate on land improvement should be lowered. This will have a double effect in the sense that it will discourage holding land in the suburdan area and encourage the renovation of existing properties.

The third issue associated with property tax involves the distinction between existing use value and development value of land. The existing use value is determined by the use for which land is actually exploited. For example, the use value of agricultural land is determined by the current and the expected yield from farming. On the other hand, the development value is attributed to advantages created by the community and public services. The land capital gain belongs to development value for which the land owner is not credited. It has been suggested that tax rate on development value should be radically raised.

The second group of proposals for combating land speculation consists of those which aim at exerting indirect influence on the land speculator's behavior. This could be done through control of zoning and provision of public service. The basic purpose of these proposals is to regulate the location of land development through pre-established town planning. In Sweden, under the Law of Cities and Towns, Article 429, Section 8, the country side can allow scattered residential development while at the periphery only close and continuous development is allowed. The purpose of this measure is to discourage the speculator to speculate on land distanced from the developed area. In France, the periphery lands are classified into priority and deferred development area. The latter area is held in reserve. Should its owner wish to sell it for development, he must offer it first to the local authorities and in the event of disagreement on price, local expropriation make take place. In Spain, if serviced land is not developed within a prescribed period, it is expropriated. In all these cases, speculation is discouraged.

The third group of proposals concerns public land ownership. The system of public ownership is not new. In the United States, something like 20% of lands is owned by governments of various levels for public utilities and public welfare. But, the

trouble is that it is not enough to combat speculation. A few attempts have been made to extend public land ownership. In 1962, the State of Californie set up a high powered Advisory Commission on Housing Problems (The Eichler Commission) to report on housing and land problems on a state-wide basis. One of the Commission's recommendations was to assembly land by public authorities and sell it to private developers. While Bryant (28) seems to be disappointed of the Commission conservative recommendation, Guthrie foresees a difficulty in outright nationalization of land. Guthrie argues that nationalization of land would provoke anger to municipalities and provoke suspicion. He suggests, instead, a system in which the whole community would form a company through which all land transactions would be made and under which ownership wuuld be voluntarily amalgamated which proper interest. (29)

Bryant reports that public land ownership is widely spread out in England, Australia and in many continental European countries. The Canadian experience, in this area, is limited and unhappy one. In Halifax, 50 years ago, Sir Sadford Fleming offered the city to donate a large piece of land, but the

city turned it down because it did not see what to do with it. The City of Montreal acquired, after the last world war, a considerable amount of lands on account of tax deliquencies, but the city soon sold them to private developers.

It may be argued that the situation in Canada is not acute as it may be elsewhere. However, the truth is that although there is a lot of vacant land, the urban land at the right price at the right location may be as scarce as it may bo in other countries. (30) Indeed, extended public land ownership is justified in Canada.

> "... it is strongly urged that public ownership of same kind is the only reform that can at one and at the same time achieve two objectives, firstly, to retain value created by the community for the benefit of the community, secondly, to render possible a careful and rational control of development, both in its naturo and its timing." (31.

Bryant's argument appears quite logical, but it raises the difficult problem of determining the amount of development valuc. In other words, he puts us right back to the issue of use value versus development value of land.

The distinction between use value and development land value is more than of academic interest. In view of the fact that most of available land is presently owned by the speculator in the Montreal area, the only way for the city to acquire land is though land purchases from the speculator. In this connection, two problems arise. First, one has to determine the price at which lands will be bought. Second, one has to decide what to do with those whose speculative lands will not be bought by the city. Neither problem is easy to solve.

It can be argued that the speculator will be paid only the normal profit after deducting from the asked price the capital gains or development value. The British experience is revealing in this regard. In 1941, the British Government set up a committee under Mr. Justice Uthwatt, to examine several problems related to land. One of the objectives was concerned with development value and with the way in which compensation payment should be made to those whose speculative lands would not be bought.

One of the committee's recommendation was that in urban areas, the value of all sites should be ascertained every 5 years and there should be a levy of 75% of increase in value of over five year's period. In other words, the development value was assumed to be 3/4 of increase in value. This recommendation was rejected and replaced, in 1944, by the White paper on the Control of Land use. Its major point was that the landowner allowed to develop land should be subject to a levy of 80% of the difference between the value of land with the benefit of permission to develop and its value which would have prevailed in the absence of such permission. For the landowner whose land is refused for development he should be compensated if his land value decreased below its 1939 price. Furthermore, compensation was to be entirely financed with the proceeds from the 80% levy. The 80% buy was later replaced by a 100% levy in 1947.

The British attempt to control the value of land did not succeed, because even the price of those lands refused for development continued to rise.

But, it is interesting in the sense that it was a first major attempt to apply the principles of use and development value. If the City of Montreal wishes to buy up speculative land for the purpose of urban planning, it should carefully consider the British experience. In essence, the British experience suggests possible difficulties on two fronts : the determination of development value and the system of compensation. We may add another dimension to it, particularly in Canada. The wide scaledland acquisition for public purpose requires a suitable financial commitment on the part of tho local government. The present financial capacity of many metropolitan areas does not seem encouraging for any major innovation in this area :

> "But so long as the source of municipal finance are such as to create inter-municipal competition for development and taxable assessement, no effective control can be exercised. For this reason, the regional agency would require similar powers." (32)

To sum up our discussion of public intervention in land development, three observations may be made. First, reasonable solution of land problems would involve in one way or another a system in which public

authorities would intervene in a more vigorous way than now. Second, wide-scale public land ownership has not been experienced sufficiently in Canada and a series of studies seem to be essential prior to any serious attempts be made. It is romarkable, indeed, that such a vital problem as land speculation has not led to serious studies, theoretical as well as empirical.

The final point is that outright nationalization of land is not only beyond the capacity of local governments but also raises a series of questions related to allocation and income redistribution among varicus groups. It needs more investigations. Burrough's remark may be considered :

> "Countries which as a matter of principle prefer public ownership of land require a rational system of its allocation to proper rises. A competitive price system for allocation of publicity owned land, properly modified by controls to reflect social concern, provides balance of economic and non-economic values.
>
> Countries with a preference for private ownership of land depend on a public system for rational allocation but should protect community and social obligation through a variety of controls such as zoning, codes, taxation, and other ways.

> Pratical considerations such as difficulties in maintaining effective control of present and future land use may suggest public ownership of part of the land." (33)

In short, there is no simple solution. The final solution requires a proper mix of private and public land ownership and private incentives controlled by public authorities.

To sum up the whole chapter, we have seen that land sepculation is inevitable not only because of the very nature of the land market but also because of certain built-in features of the present system of public controls. We have tried to understand land speculation in term of the economic theory of investment and this approach suggests further theoretical and empirical studies of the land speculator's behavior. Finally, we have examined some of the popular solutions which have been recently set forth by various writers. It is quite clear that a bolder and more imaginative solution should be found it one wishes to combat land speculation and rationalize future land use.

P A R T T W O

CASE HISTORY OF LAND

CHAPTER IV

CASE HISTORY OF LAND DEVELOPMENT IN FABREVILLE, P.Q.

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We have chosen a parcel of land in Parish Ste-Rose in former Fabreville, which is now a part of the City of Laval. The parcel of land chosen is Cadastre no. 226 which measures about 115 acres. The exact location of the land is shown in a map in the appendix. This particular land was chosen for two reasons. First, it was known that there had been a reasonable amount of speculation since 1955. Second, it happened that some of the officials of the C.M.H.C. regional office were quite familiar with the area.

Former Fabreville is only a small part of the City of Laval. Its size and its construction activities may be inferred from the following table.

Table 1.

Number of Houses Completed, 1955-1968, former Fabreville and Laval

Year	Fabreville	City of Laval
1955	14	2,251
1956	1	2,242
1957	7	1,829
1958	43	2,590
1959	124	2,892
1960	150	2,286
1961	355	3,049
1962	342	3,356
1963	159	3,073
1964	115	3,224
1965	120	3,083
1966	91	1,853
1967	449	2,314
1968	232	2,137

Source : Planning Department City of Laval.

If the foregoing table means anything, residential construction activities in Fabreville have been rather volatile, but the period from 1958 to 1962 can be singled out for the most sustained growth of residential construction when the number of completed houses increased from 7 in 1957 to 43 in 1958 and, since then it has increased very rapidly

to attain 355 in 1961. Since 1961, however, construction activities have slowed down somewhat until 1966. Since 1967, they seem to have picked up again some vitality.

What follows is then the description of the evolution of a small piece of land against this general background.

1. Theoretical framework

Our original intention was not only to examine the availability of statistical data concerning land development but also analyze the behavior of various individual and institutions involved in land development process. But, soon we found out that such an ambitious research project would require a large amount of resources, financial as well as human. Therefore, we have had to limit ourselves to a mere description of the stages of land development, identification of decision agents and evolution of land price.

2. Data

Anyone who has had some experience in this field would admit that one of the main difficulties in any serious studies is the absence of statistical data. This may be attributable to several factors. First, the process of land development has not attracted, until recently any way, the attention of able research scholars. This is applicable to all areas in urban economics, but it is particularly noteworthy in the area of land development. The second factor is that the public has been more or less interested in land transactions because of legal complexity involved. As a result, information on land deals has been almost monopolized by notaries, appraisers and a few other groups of people directly involved. Third, even the available information at local registry offices is not only often incoherent but also difficult and expensive to obtain. As a matter of fact, to obtain information used in our pilot study, a professional appraiser who knows the area quite well had to spend about three weeks to trace back a series of transactions of 115 acres of land.

By and large, at the present, there are two main sources of information related to land transactions, namely, local registry offices and municipal officials. It was pointed out above that it is very expensive to get data from registry offices. Apart from being very expensive, the data available at local registry offices raise a number of difficulties. First, legal expressions do not make it easy to interpret them. For example, we have noticed that some transactions involved only one dollar plus "other considerations". It is impossible to interpret these "other considerations". Second, the data are not complete. We were informed that some land transfers were not registered. Even those transfers which are duly registered, several types of information such as the date of transfer, the lot size, the main activities of individuals and firms involved are not indicated. We were told that the location of land could be found only by consulting the office of the land surveyor.

Even if the data available at local registry offices are complete, they are not sufficient for the kind of studies which must be done in order to better understand the process of land development.

For example, it is important to know the various characteristics of individuals and firms involved in land transfers. Unfortunately, the data of the registry office do not provide this kind of information. Second, in order to analyse the behavior of the speculator, we need to know not only his characteristics but also his relationships with the local government. It is not only difficult to obtain this kind of information but also one is frowned upon if one insists. Third, it is equally vital to know the roles played by the local government in the land market. We have found out that the local government possesses much more information than one might have thought, but the available data are not systematically organized owing perhaps to the lack of interest on the part of the local government to undertake the kind of studies we are interested in. However, a series of discussions with officials of various municipalities convince us that with adequate financial aid and encouragement, it is possible to gather many relevant data.

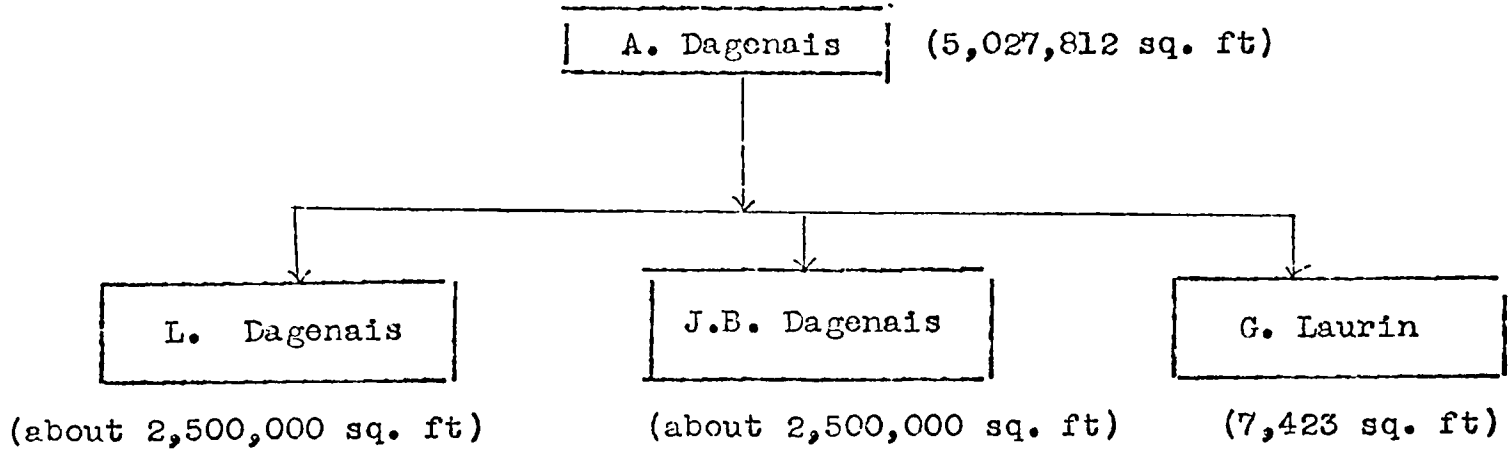
3. Case History

The land we have examined was originally owned by a farm-family and, in 1955, it was owned by one of its descendant, A. Dagenais. In 1955, the land of about five million square feet was given to three individuals : L. Dagenais, J.B. Dagenais and G. Laurin. The first two are obviously the sons of A. Dagenais. It is not known why G. Laurin received a part of the land. Each of the two sons of A. Dagenais received about 2.5 million square feet. This is illustrated in Diagram I below.

In order to examine the evolution of land since 1955, we have prepared three diagrams for the three branches of land development since A. Dagenais' donation. Diagram II traces the series of land transfers from L. Dagenais ; Diagram III traces the evolution of J.B. Dagenais' land ; and, finally, Diagram IV shows how G. Laurin's land developed. These three diagrams show land development until the second stage explained erlier, namely, the transition from farm to urban land.

Diagram I

Evolution of land prior to 1955



NOTE :

(1) At the moment of the transfer of land from A. Dagenais, the acreage of land was 5,027,812 sq. ft, i.e. about 115 acres.

(2) The figures in brackets are the sizes of land.

They do not show the third stage, that of sub-division, for which Diagram V is prepared.

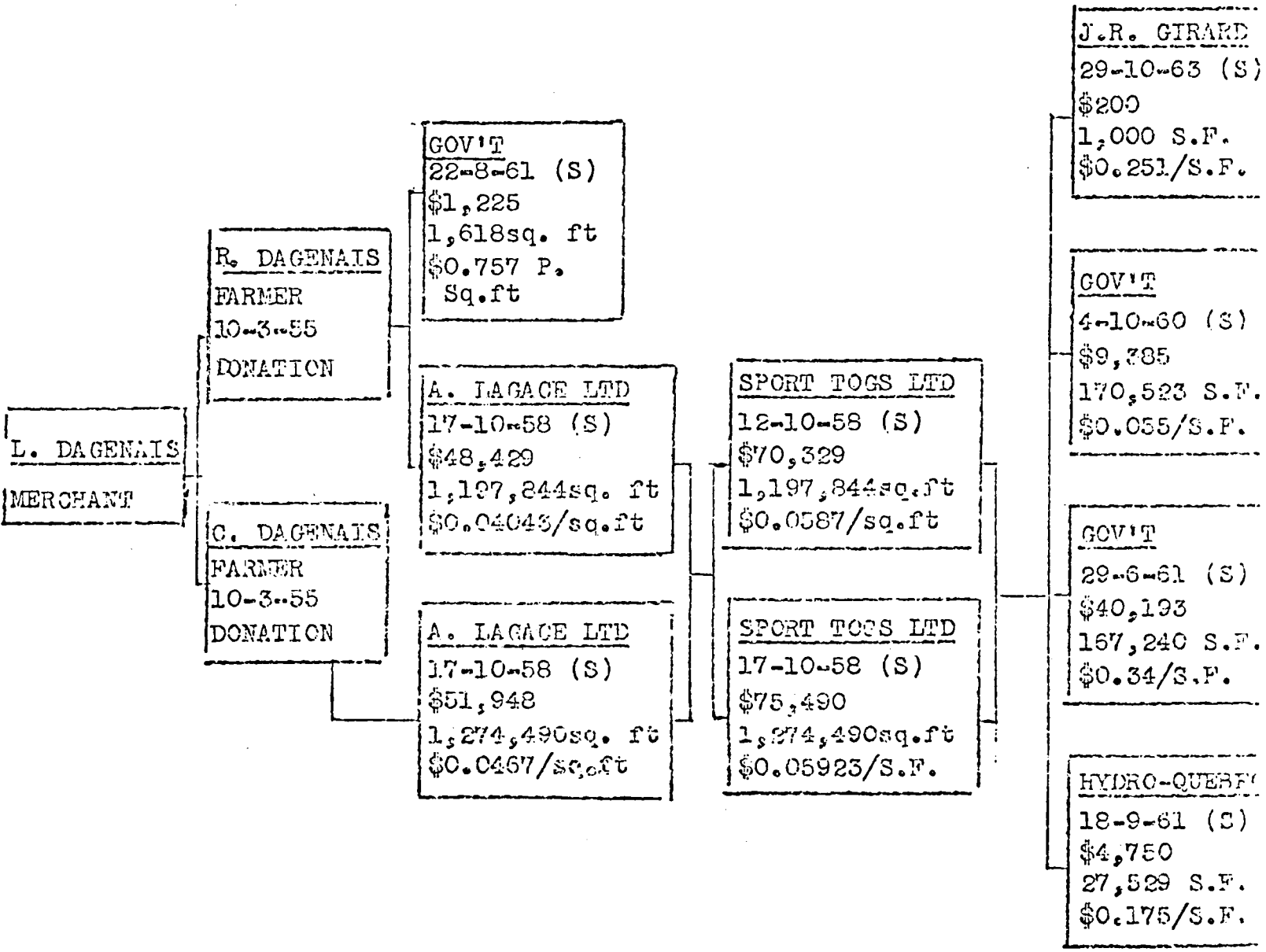
The first branch (Diagram II) starts from L. Dagenais who received, in 1955, about 2.5 million acres. L. Dagenais who was a merchant denoted his land, in 1955, to R. Dagenais and C. Dagenais, who are obviously his relatives, perhaps his sons. R. Dagenais sold, in 1961, about 1,600 sq. ft to the Quebec Government for $0.76 per sq. ft, which was a fantastic price at that time. He sold most of his land, in 1958, to a probable speculator, A. Lagacé Ltd, at about 4 cents per sq. ft. Lagacé Ltd, in its turn, sold, on the same day, to Sport Togs Ltd at 5.9 cents per sq. ft, that is, at a profit of 45% in a single day.

Lagacé Ltd also bought a large amount of land in 1958, from C. Dagenais, who was a farmer at 4.0 cents per sq. ft and sold it to Sport Togs Ltd, at 6.0 cents per sq. ft. Thus, Lagacé Ltd bought, in 1958, about 2.5 million sq. ft, from the Dagenais family and realized a profit of $45,442 in a single day by selling the land to Sport Togs Ltd.

Sport Togs Ltd sold various parts of its land to the Quebec Government and J.R. Girard. In 1963, R. Girard bought 1,000 sq. ft of land at 25 cents per sq. ft. In 1960 and 1961, Sport Togs Ltd sold sizable tracts of land to the Quebec Governement, at a unit price varying between 5.5 cents and 34 cents. The firm also sold, in 1961, to Hydro-Québec, about 27,000 sq. ft, at a unit price of 17.5 cents. Thus, the unit profit rate realized by Sport Togs Ltd, in a period varying from 2 to 5 years, varied between 300% to 500%.

Diagram II

Evolution of Land since 1955 : Branch A



NOTE : (S) stands for sales

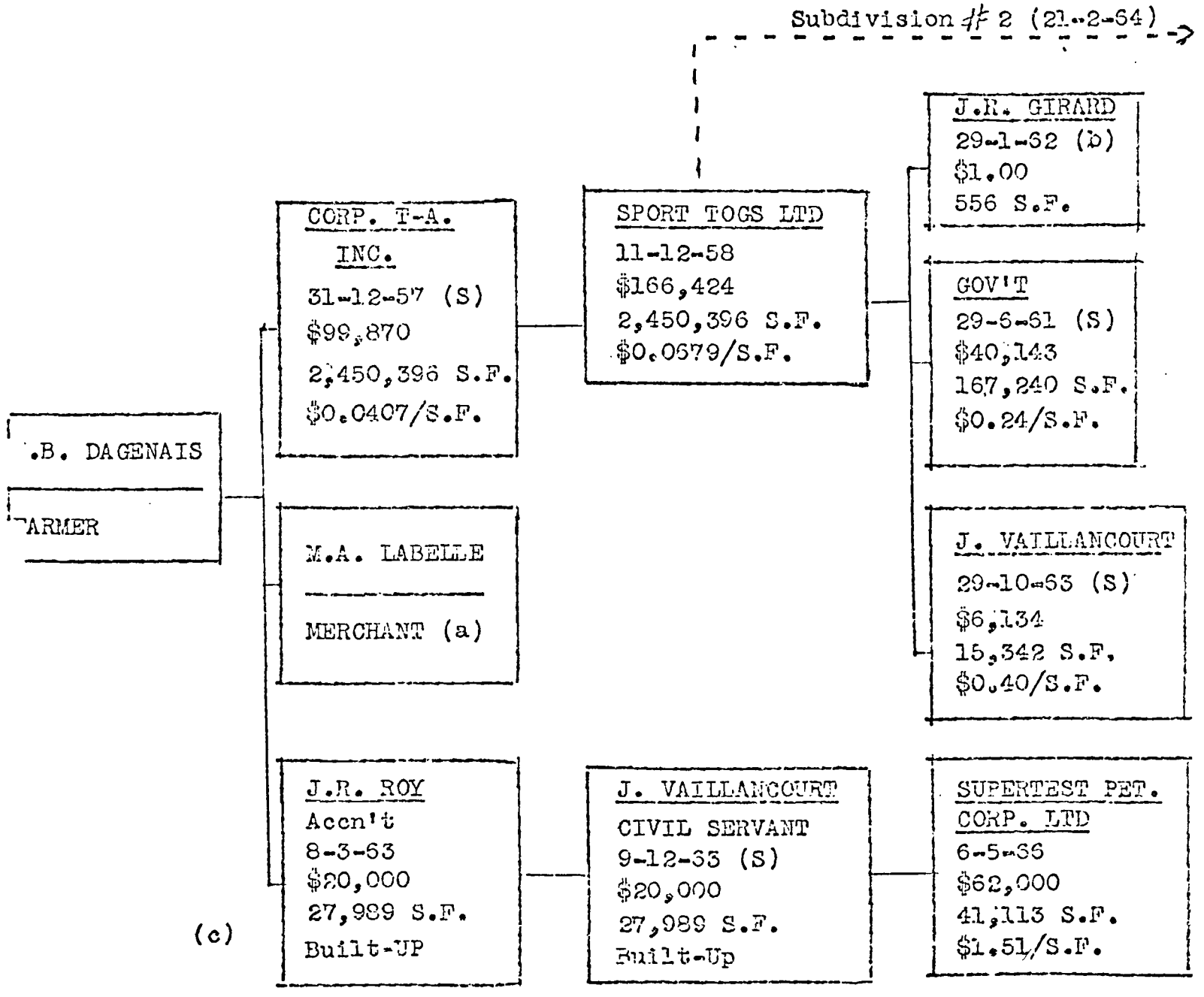
S.F. = square foot

This second branch of land development starts from J.B. Dagenais' land. This is shown in Diagram III . In 1957, J.B. Dagenais sold virtually his whole land to Corp. T-A. Inc., which is obviously a speculator. The unit price was 4 cents sq. ft . Then, he sold to J.R. Roy, a built-up land at $20,000. This built-up land was subdivided, in 1957, by J.B. Dagenais, who was a farmer.

The Corp. T-A. Inc. sold, in 1958, the entire land of 2.5 million acres to Sport Togs Ltd, at a unit price of 6.8 cents, materializing a global profit of $66,554, in a period of one year. Sport Togs Ltd sold various parts of his land to the Quebec Government in 1961, at a unit price of 24 cents, to J. Vaillancourt, at a unit price of 40 cents, and a company at a unit price of $1.51. This meant that Sport Togs Ltd materialized in a period of 3 to 8 years, a unit profit rate varying between 270% to 2,000% . It is interesting to note that Sport Togs Ltd sold, in 1962, to J.R. Girard, 556 sq. ft for $1.00 for "other considerations".

Diagram III

Evolution of Land since 1955 : Branch B



(a) Convention/Hyp. - - - (b) Other considerations

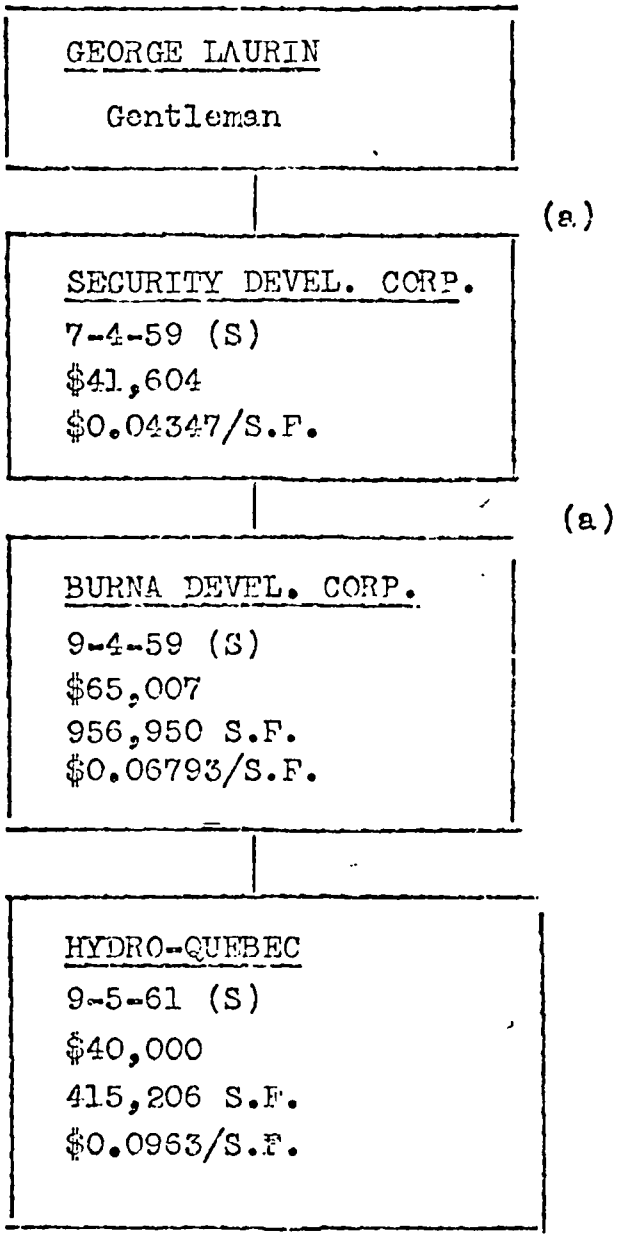
(c) This part of land was subdivided on 23rd of December 1957.

The third branch of land development concerns G. Laurin's land. As it was pointed out earlier, in 1955, Laurin received a little more than 7,000 sq. ft from A. Dagenais. In 1959, he sold about 956,000 sq. ft to the Security Development Corp., at a unit price of 4.3 cents. What is striking is that two days later this firm sold the same land to BURNA DEVEL. CORP., at a unit price of 6.8 cents. Although it is not proved, it is quite possible that these two firms are the same, so that the sale might have been motivated by their intention of strengthening their bargaining position with Hydro-Québec which bought, in fact, two years later, part of the land at a unit of 9.6 cents. The global profit materialized by this manoeuvre was $21,700 involving about 415,000 sq. ft.

The foregoing analysis of land development indicates that the principal land speculators are A. Lagacé Ltd and the Corp. T-A. Inc. The firm Sport Togs Ltd seems to act not only as a speculator but also as a subdivider. Here is a case of speculator-developer referred to earlier in Part I of the present study.

Diagram IV

Evolution of Land since 1955 : Branch C



(a) Both firms have the same address.

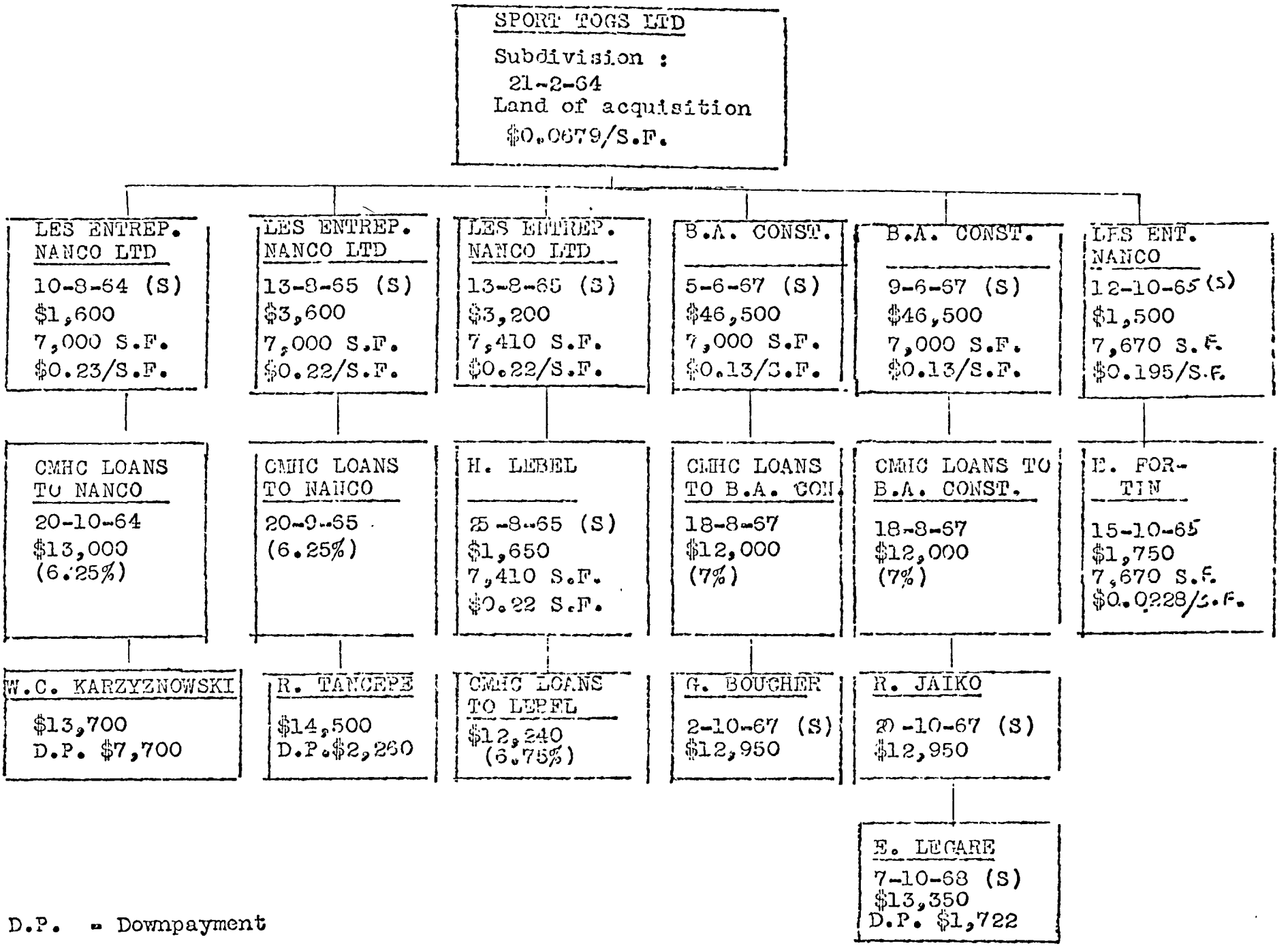
Sport Togs Ltd subdivided a part of its land in 1964 and sold it to various people. This is illustrated in Diagram V . There are great many subdivisions of the original land, but we have limited to a few because of limited resources we had.

We have seen in Diagram II and III that Sport Togs Ltd bought, in 1958, a large amount of land at a unit price varying between 6 to 7 cents. The firm subdivided in 1964 a part of its land, and sold at a unit price varying between 13 to 23 cents per sq. ft. Now, according to the officials of the Planning Department of the City of Laval, the unit cost of subdivision, in 1964, was about 4 cents. This means that Sport Togs Ltd materialized a unit profit of 9 to 19 cents per sq. ft, or a profit rate of 50% to 210% . Sport Togs Ltd made more profit by selling undeveloped land than by selling subdivided land.

This sums up briefly the case history of 115 add acres of land. Few general observations are in order.

Diagram V

Evolution of Land since 1955 : Subdivision



D.P. = Downpayment

4. Decision units involved

In Part I, it was pointed out that, by and large, four types of decision units are involved in the land development process, namely, the farmer, the speculator, the developer, the builder and, of course, the household. Our little study shows all these decision units. The original land was owned by a farm-family who suddenly became a rich family in 1958, because of urbanization. Land speculation seems to be performed by two principal firms. No amateur land speculator appears to have played any important role, except a civil servant who according to Diagram III made a handsome profit by selling a built-up land to a firm. He made a profit of $42,000, in a period of three years. That land speculator becomes more and more professional has been confirmed by a study recently undertaken by the City of Montreal.

We have found a case of speculator-developer, namely, Sport Togs Ltd. It is interesting to note that the firm made a greater rate of profit by acting as a speculator than as a land developer.

In our sample, the first speculator did not hold lands for long, about a year, in the case of Corp. T-A. Inc., and three years in that of A. Lagacé Ltd. The second speculator-developer held land for 6 years prior to subdivision, and 2 to 5 years prior to direct sales of undeveloped land.

5. Variation of Land Price

The speculative gains are considerable. In the case of Corp. T-A. Inc. made a unit profit of 70% in a year. On the other hand, A. Lagacé Ltd made a profit of 45% in the same year. The second speculator, Sport Togs Ltd made varying profit rates depending upon whether land was sold subdivided or sold undeveloped. With the Government of Quebec, the firm made a profit rate varying between 300 to 400%, in a period time varying between 2 to 3 years. When the firm sold subdivided land, the profit rates varied between 20% to 130% over a period of time varying between 2 to 5 years. In short, land price appears to increase more rapidly during the period of speculative transfers than during any other stages of the process of land development.

To sum up, the local registry office offers useful information on land transactions, but these data are not only expensive to obtain but also incomplete and much limited for serious studies. It is hoped, however, that with proper cooperation with local government officials it will be possible to realize some useful studies.

The sample used for our pilot study is too small for any generalization, but what was observed seems to confirm rather closely common belief and the results of a few available studies. In the case of our sample, the period of speculative holding is not very long, about 7 years. This is somewhat shorter than what other studies have shown. The speculators are not amateur individuals, but powerful well-organized firms. The speculator sometimes makes fictive sales in order to his bargaining position. The speculative capital gain is very high; the price often doubles in a single year.

CHAPTER V

FURTHER STUDIES

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FURTHER STUDIES

We have started out with the review of some of the previous theoretical and empirical studies. It was shown that there are two groups of studies and approaches. The first approach was to analyse the behavior of decision agents involved in the land development process. The second approach was intended to study the structure of the land market through the study of locational distribution of land values. Each of the approaches seems to be valid and one is complementary to the other. What is needed is a more general theoretical framework which includes both approaches. There is much need for theoretical research.

As far as the empirical work is concerned, future studies may be oriented along the way indicated below.

A - GROWTH OF LOCAL ECONOMY AND NEEDS FOR LAND

It is vital for town planner to know how much more land is needed in the short and the long run as the local economy grows.

B - DISTRIBUTION OF LAND

It is not enough to know the total amount of needed land in that region. One should be able to foresee the locational distribution of lands. Here, we need both growth and allocation models for land.

C - ANALYSIS OF THE DECISION AGENTS' BEHAVIOR

This is the sort of study we have undertaken and must be repeated on a wider scale. This study must be multidisciplinary involving not only economists but also sociologists and other suitable specialists.

D - FINANCING OF LAND SPECULATION

Nothing is known about the financing of land speculation. It is often said that in certain areas, a substantial amount of foreign capital is invested in land speculation. It seems quite proper to investigate the source and the cost of land speculation financing.

E - ANALYSE OF POLICY IMPACT

The most needed study seems to be analysis of impact of various public policies not only on land price but also land use. It is widely admitted that the public authorities exert great influence on land price and land development, but very few empirical studies have been completed. For example, it is important to know how a given public work project affects the price of land.

F - PROBLEMS OF DATA

Finally, it may be pointed out that

serious attempts should be made to facilitate the diffusion of data concerning the land market and to improve their quality. Investment in this area may be as much profitable as investment in urban renovation projects which are often based on incomplete information.

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FOOTNOTES

FOOTNOTES

INTRODUCTION :

(1) Report of the Task Force on Housing and Urban Development, January 22, 1969.

(2) Service d'Urbanisme, Montréal, Technical Bulletin No. 5, 1966.

(3) Ibid., p. 22.

(4) Ibid., p. 48.

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(1) WEISS, S.F. et al. Residential Developer Decision, University of North Carolina, 1966.

(2) Service d'Urbanisme, City of Montreal, Technical Bulletin No. 5, 1966.

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(4) Ibid., pp. 17-18.

(5) Ibid., p. 22.

(6) Ibid., p.

(7) MASSIE, R.W. and KAISER, E.J. Landowner Behavior : Factors in the Decision to Hold or to Sell Property on the Urban Fringe, Research Review, Vol. 15, No. 1, April 1968.

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(9) KAISER, E.J. et al. "Predicting the Behavior of Pre-Development Land Owners on the Urban Fringe", A.I.P. Journal, September 1968, pp. 328-333.

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(11) Ibid., p. 329.

(12) KENNEDY, K.B. Pre-Development Land Ownership Factors and Their Influence on Residential Development, Research Monograph No. 31, University of North Carolina, 1965.

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(15) WEISS et al. Residential Developer Decision, A Research Monograph, University of California, 1966.

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